REMARKS

The Office Action mailed March 26, 2010 has been carefully studied, and the undersigned thanks the Examiner at the outset for his thorough review of the application.

The specification has been reviewed per the Examiner's suggestion, and numerous typographical errors and other inadvertent errors have been corrected. None of these amendments are believed to introduce new matter, and none are made with the intent of narrowing the scope of claim construction.

In response to the undersigned's telephonic query shortly after receipt of the Office Action concerning the expressed requirement for new drawings, the Examiner has advised that the requirement was an error. Figures 1, 3, 6 and 7 have, however, been amended to conform to the text in the specification, and substitute sheets 1/10, 2/10, 4/10 and 10/10 are accordingly submitted herewith. Again, no new matter is believed to have been introduced, and there is no intent to narrow the scope of the claims by virtue of these amendments.

The Examiner's objections under Section 112 have been carefully reviewed. It is believed that the amendments made to the claims moot most of these objections. Where not believed to be mooted, the Section 112 objection is discussed below together with the Section 102 rejection or Section 103 rejection of the claim, as the case may be.

The Examiner has initially rejected Claims 1-7 and 10 under 35 U.S.C. 102 based on U.S. Patent 6,011,992 to Hubbard (hereinafter, the '992 Patent). Claim 1 has, however, been cancelled; Claim 2 has been amended to more distinguish the claimed invention.

The '992 Patent is not believed to anticipate the claimed subject matter. For example, it is not believed that (1) it digitally processes the measurement signal to substantially offset the effects of component aging, tolerances and temperature on measurement signal accuracy (Office Action, pg. 12, first bullet point), (2) it includes means for substituting a plurality of electrical resistors in lieu of a body resistance to the amplifier for sending (*Ibid*, third bullet point), (3) it digitizes and stores in memory a plurality of measurement signals corresponding to simulated body resistance values (*Ibid*,

fourth bullet point), (4) it interpolates between measurement signals derived from simulated body resistance values to quantity expected measurement signal values for additional body resistance values (*Ibid*, fifth bullet point) or (5) forms and stores a table of expected body resistance values (*Ibid*, sixth bullet point). Moreover, as discusses later, the '992 Patent fails to disclose or suggest a device having other features recited in Claim 2.

Turning initially to the '992 Patent, it comprises a resistance measuring circuit 20 to transform the measured resistances across the living body into a measurement signal. The resistance measuring circuit is best shown in Figure 3, where it comprises a voltage-divider network coupled between a high voltage potential 56 and a low voltage potential 76. The resistance measuring circuit, itself, comprises (in series) a first resistor 58, a trim adjustment potentiometer 60, a meter check circuit that places either a fixed resistor 68 (for calibration purposes) or the living body resistance (between electrodes 66, 64) in circuit, and a third resistor 74. The effect, of course, is that the changing body resistance between the electrodes causes the voltage to change at the junction of electrode 64 and resistor 74 (ignoring winding 86 for the purpose of discussion).

(At this point, I digress for a moment to point out the effect of raising the low voltage potential towards the high voltage potential. As this difference becomes minimal, there is correspondingly less range of voltage change possible in representing the changing body resistance; thus, the same change in body resistance causes less of a measurable voltage change as the low voltage potential approaches the high voltage potential. Further, changes in the measured voltage caused by RF interference and other "noise" sources become more significant when the changes sought to be measured are smaller. Thus, we can think in terms of two ranges of voltages at this point (which become meaningful later in this description): the range in which such "noise" is not a factor, and the range in which "noise" is a factor.)

The changing measurement signal (i.e., changing voltage at the junction of electrode 64 and resistor 74) is sent as "measurement signal 88" from the output of the Figure 3 circuitry to the input 126 of a first stage "summing amplifier" 34 (Figure 4A), which comprises a voltage follower amplifier 124 and a first stage amplifier 138. The

output of amplifier 138 is fed through resistor 170 to a second stage amplifier 36 comprising (in part) amplifier 172.

The gain of the amplifier 172 is determined by three feedback circuits. First, there is "high-gain circuit" 46 (Figure 4B), which is connected via line 226 in a feedback arrangement to input 182 of amplifier 172. Second, there is a low-gain circuit 44 which is also, but selectively, connected via line 226 to input 182 of amplifier 172. Lastly, there is a digitally controlled resistance value from component 354 (Figure 4C). The "resistor" may be though of as extending between pins 5 (R+) and pin 6 (TA_ref_) of the device, and one can see in Figure 4A that (1) the R+ is connected to line 226 at the top left corner of the "high gain circuit" 46, and (2) the other end (TA_ref) is connected to lead 180 of amplifier 172 (through resistors 162, 164).

Thus, the high gain and low gain circuits are coupled to the inverting input of the amp, and the digitally variable resistor is coupled between the two inputs of the amplifier.

The '992 Patent's system is configured to switch the low-gain circuit 44 in or out, depending on the value of the low voltage potential 76. As now described, the switching of circuit 44 into the feedback to amplifier 172 results in a "sensitivity adjustment"; that is, a given voltage difference into the amplifier results in a different voltage difference at the output of the amplifier when the circuit 44 is switched in. As you will see, this happens when the living body's resistance is within a certain range of resistances; i.e., there are two resistance ranges: one in which the amplifier gain is at one value, and the other at which the gain is at the other value. Specifically, gain is increased for high body-resistance values (those for which the low potential voltage 76 has been adjusted higher in accordance with the operation of the device).

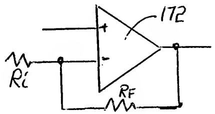
To review, one can see (in Figure 3) that measurement signal 88 changes if low voltage potential 76 changes. During operation, the low voltage potential 76 is adjusted via potentiometer 82 during operation of the device. One can see that the adjustment of low voltage potential 76 upwards towards the upper voltage potential 56, results in a small voltage range between the two, within which differences in body resistance must be detected as very small voltage changes within that narrow range. For such small ranges, gain circuit 44 is needed. Otherwise, gain circuit 46 controls the gain. Within gain

circuit 46, resistors 240, 241, 242 are always in the feedback path. The others (R234, R238) are only switched into the path when desired. This is done with switch 256 (Fig. 4B).

The gain circuit 44 is activated by the MCU 334 (Figure 4C) which sends a signal via pin 8 to the control pin CTL of latch 244 (Figure 4B). Then, the specific branch within gain circuit 44 is chosen with switch 256. The MCU activates gain circuit 44 by monitoring the value of the low voltage potential 76 at pin 14 (Figure 4C).

The patent describes the operation of the device wherein the system is initialized by adjusting the trim control 60 (Figure 3) and other circuitry so that the low voltage potential 76 is balanced for the resistor 68. A living body is then connected across the external leads 64, 66 of the resistance measuring circuit. In order to balance the circuit according to the overall resistance of the living body, the manual adjustment 78(comprising either potentiometer 82 or remote potentiometer 94) is changed until the low voltage potential 76 achieves a balance with the overall resistance in the living body As the manual control device 78 is adjusted, the control circuit 54 determines the gain adjustment value and signals the compensator circuit 55 to adjust the gain of the amplifier circuit.

An alternative way to view the configuration of the '992 Patent's second stage amplifier 36 (Fig. 4A) is in a simplified form; namely a simple amplifier with a feedback resistor Rf and an input resistor Ri:



The gain of this amplifier is determined by the ratio: $\frac{Rf}{Ri}$ and, as described earlier, the gain of second stage amplifier 36 is automatically controlled in response to the level of the low voltage potential 76. In the '992 Patent, the feedback resistance Rf includes one of two possible feedback paths. The "high gain" circuit 46 (Figure 4B) is

always connected to the second stage amplifier 36 (Figure 4A) via leads 226, 228 (which are coupled to opposite sides of capacitor 230 in Figure 4B).

When the nominal body resistance is in a first, low range of resistances, the feedback path is changed by switching in low gain circuit 44. This effectively shunts high gain circuit 46.

In addition to adjusting the value of the Rf component, the '992 Patent's device also uses an adjustment to the Ri component to obtain the needed gain changes at the appropriate times. The resistance Ri includes a digitally-controlled variable resistor 354 (Figure 4C). This is coupled at its pin 5 (Figure 4C) to the second stage amplifier 36 (Figure 4A) via lead 226. More specifically, its value (designated as "R+" in Figure 4B at the top left of flip-flop 232) is coupled by lead 226 to the inverting input of op amp 172 of amplifier 36.

The gain of the second stage amplifier 36 is continuously adjusted by the automatic manipulation of the Ri and Rf values each time the operator nulls the meter needle to keep the meter's needle deflection for a given body-resistance change generally constant throughout the range of body resistances that can be encountered. The range of possible body resistances is divided in two; namely, a first range of the relatively low body resistances, and a second range of the relatively higher body resistances.

Within the first (low resistances) range, the gain of the second stage amplifier 36 is essentially determined by low gain circuit 46 in the feedback path (the "Rf" value) and by MCU 334 (Figure 4C) then automatically adjusting the digitally controlled variable resistor 354 to obtain the Ri value that gives the desired gain for that low voltage potential. Within the second (high resistances) range, the gain of the second stage amplifier is essentially determined by the high gain circuit 42 which is essentially substituted into the feedback path by uncoupling the low gain circuit 46 from the feedback path. The coupling and uncoupling of the low gain circuit 46 into the feedback path is triggered by an enabling signal applied to the control terminal of its flip-flop 244 (Figure 4B) by pin 8 of MCU 334. MCU 334 does this when it detects the operative level of low voltage potential 76 at its pin 14. In summary, MCU 334 monitors the low

voltage potential 76 and selects which of the two feedback circuits 44, 46 is the operative circuit.

So far, the Rf value of the simplified circuit has been addresses. Turning to the Ri value, the digitally controlled variable resistor 354 is controlled by MCU 334 in response to the value of the low voltage potential 76 applied to its pin 14, using a "look-up table" for the desired setting of the resistor.

The device defined by Claim 2 as amended is neither disclosed not suggested by the '992 Patent, but is configured in an entirely different and novel manner. Claim 2 recites, for example,

· *means for digitizing the measurement signals corresponding to the simulated body resistance values, and storing in memory the resulting plurality of calibrated measurement values corresponding to the plurality of simulated body resistance values,*

Comment: The device of the '992 Patent does not digitize measurement signals corresponding to simulated body resistance values. The cited portion of the '992 Patent (col. 8, lines 15-18; col. 9, lines 14-22) are believed to refer to the lines by which the MCU 334 detects whether the low gain or high gain feedback circuit is to be applied across the second stage amplifier 36. While there is control of a digitally controlled variable resistor 354 by the MCU, it is not believed that this meets the recited limitation in Claim 2, or that this reads on the recited configuration of the claimed device.

· *compensation means for computing, based on the stored calibrated measurement values, calibrated measurement values to be associated with respective additional body resistance values*

Comment: It is not believed that "computing" is performed in the '992 Patent, nor are any "stored calibrated measurement values" believed to be present.

· *means for producing an indicator-driving series of digital difference values during the monitoring of the living body's resistance that represent the difference between the monitored living body's digitized measurement values and a selected user-adjustable base value, the user-adjustable base value being selected by the user from calibrated measurement values*

Comment: No "digital difference values" are believed to be produced during the monitoring the living body's resistance, much less "digital difference values" which represent the difference between the monitored living body's digitized measurement values and a selected user-adjustable base value.

• *means applying an automatic correcting gain factor to the indicator-driving value as a function of the selected base value to produce the processed measurement signal, the gain-applying means applying a first non-linear gain when the selected base value corresponds to a very low living body resistance value of less than a first body-resistance value, and a second non-linear gain when the selected base value corresponds to a very high living body resistance value of more than a second body-resistance value, the gain for the living body resistances values between said first and second values being essentially a constant, said first non-linear gain being more than said constant and increasing with decreasing base value, said second non-linear gain being less than said constant and increasing with increasing base value.*

Comment: It is not believed that the device of the '992 Patent discloses or suggests this.

Because the configuration and structure of the claimed device is so different than that illustrated and described in the '992 Patent, the Examiner is requested to reconsider and withdraw all rejections relying wholly or partly on the '992 Patent.

Claims 3-10 are believed allowable in that they depend directly or indirectly from Claim 2 which is itself believed allowable. Discussion is accordingly omitted for the sake of brevity.

The Examiner has contended (Office Action, pg. 13, second full paragraph) that the '992 Patent "discloses a display that may be considered an optical encoder because the display is an optical component that receives code for display and is coupled to means for producing the base value as a function of the position of the manually positionable means. However, an optical encoder is device that converts the rotational position of a shaft to a digital code utilizing a light source and photo detector array to read an optical pattern resulting from the position of a disc affixed to the shaft for rotation therewith,

wherein the disc typically has transparent and opaque areas that create the optical patterns read by the photo detector array.

The Examiner has rejected Claim 10 under Section 112, first paragraph for reciting “repeatedly sampling”. Although the term “repeatedly” is not explicitly used in the specification, it is believed that repeated sampling is clearly disclosed to one of ordinary skill in the art. For example, the specification describes (with reference to Figure 3) that the meter 16 is driven by an analog output signal 480 generated by a digital/analog converter 479 in response to a series of digital signals produced by a central processing unit 400 that, in turn, is responsive to respective input signals 190, 290, 390 from front end circuitry 100, TA circuitry 20 and sensitivity circuitry 300. (pg.6, lines 7-24). The front end circuitry is described as producing, during the monitoring operation, a digital value indicative of the electrical resistance of the audited live body. (pg. 6, lines 25-27). The resistance sensed is the instantaneous resistance value, (pg. 11, lines 15-15). As described in the specification, and known to those of ordinary skill in the art, the claimed device is for indicating and measuring variations in the resistance of a living body. (pg. 1, lines 3-5, 9-12, 14-17, 26-33; pg, 2, lines 22-23; pg. 3, line 28-31).

In order to indicate changes in body resistance, sampling must be repeated. Otherwise, one merely has a single instantaneous resistance value. Accordingly, it is submitted that “repeated sampling” is disclosed within, and supported by, the specification. If the examiner believes it proper or preferable, the undersigned will amend the specification to explicitly describe “repeated sampling”; it is submitted that this would not entail the addition of new matter.

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New dependant claims 11-25 are submitted herewith. These claims depend directly or indirectly from Claim 2 and are believed to be allowable in that Claim 2 is believed allowable.

It is believed that pending claims are allowable over the cited prior art, and favorable consideration is requested.

The examiner is invited to telephone the undersigned if there are any matters that prevent allowance and issuance of a patent based on this application, and the examiner believes that a telephonic conference could resolve those matters more efficiently. (Please note that the undersigned is in the Pacific Time zone.)

Respectfully submitted,

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